

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application.

**Listing of Claims:**

- 1.(Currently Amended)      A method comprising:  
    encoding a plurality of  $N$  systematic bits across time into an encoded packet of size  $M$  bits;  
    determining a quality of at least a first channel from a feedback circuit;  
    dividing the encoded packet into a first transmission packet defining a first size  $M_1$  bits that includes  $N_1$  of the  $N$  systematic bits and a second transmission packet defining a second size  $M_2$  bits that includes  $N_2$  of the  $N$  systematic bits, wherein at least one of  $M_1$  and  $N_1$  is based on the determined quality of the first channel; and  
    transmitting in parallel the first transmission packet from a first antenna at a first rate at a first power modified by a first weight value over the first channel and the second transmission packet from a second antenna at a second rate that differs from the first rate and at the first power modified by a second weight value over a second channel, wherein  $M$ ,  $M_1$ ,  $M_2$ ,  $N$ ,  $N_1$  and  $N_2$  are all non-zero integers except one of  $N_1$  and  $N_2$  may be zero,  $M$  is greater than  $N$ ,  $M$  is at least equal to  $M_1 + M_2$ , and  $N$  is at least equal to  $N_1 + N_2$ .
- 2.(Original)      The method of claim 1 wherein dividing the encoded packet comprises maximizing a number  $N_1$  of systematic bits in the first transmission packet.
- 3.(Original)      The method of claim 2 wherein  $N = N_1$  and  $N_2 = 0$ .
- 4.(Original)      The method of claim 1 wherein  $M_1 = M_2$  and  $N_1 \neq N_2$ .
- 5.(Canceled)
- 6.(Previously Presented)      The method of claim 1 wherein transmitting further comprises:

transmitting the second transmission packet from the second antenna over the second channel at a second power modified by a third weight value, and from the first antenna over the first channel at the second power modified by a fourth weight value.

7.(Original) The method of claim 1 wherein encoding a plurality of  $N$  systematic bits across time into an encoded packet of size  $M$  bits comprises interleaving over the  $M$  bits.

8.(Original) The method of claim 7 wherein encoding further comprises turbo encoding using a single turbo interleaver of size  $N$  prior to interleaving over the  $M$  bits.

9.(Original) The method of claim 1 wherein determining a quality of at least a first channel comprises determining a capacity of said first channel.

10.(Original) The method of claim 1 wherein determining a quality of at least a first channel comprises determining a quality of a second channel, and the values of  $M_1$  and  $M_2$  are determined from the quality of the first and second channels.

11.(Currently Amended) A device comprising:

an encoder having an input for receiving a plurality of  $N$  systematic bits and an output for outputting a plurality of  $M$  bits, wherein  $M$  is greater than  $N$ ;

a channel feedback circuit for determining a channel characteristic of a first communication channel;

a demultiplexer having an input coupled to an output of the encoder and an input coupled to an output of the channel feedback circuit, said demultiplexer for outputting in parallel a first portion  $M_1$  of the  $M$  bits at a first output and a second portion  $M_2$  of the  $M$  bits at a second output;

a first amplifier coupled to said first output for increasing a power of said first portion  $M_1$  of the  $M$  bits;

a first antenna coupled to the first output for transmitting at a first rate said first portion  $M_1$  of the  $M$  bits;

a second amplifier coupled to said second output for increasing a power of said second portion  $M_2$  of the  $M$  bits;

a second antenna coupled to the second output for transmitting, at a second rate that differs from the first rate, said second portion  $M_2$  of the  $M$  bits; and

a first eigenvector block in series with the first output, said first eigenvector block coupled to said first and said second antenna for applying a first power weight factor to said first portion  $M_1$  of the  $M$  bits prior to transmission from said first antenna and for applying a second power weight factor to said first portion  $M_1$  of the  $M$  bits prior to transmission from said second antenna.

12-13.(Canceled)

14.(Previously Presented) The device of claim 11 wherein said first and second power weight factor are based on at least one of a size of said first  $M_1$  and second  $M_2$  portion and a channel quality of a first and second channel provided by said channel feedback circuit, said first antenna transmitting over said first channel and said second antenna transmitting over said second channel.

15.(Previously Presented) The device of claim 11 further comprising:

a second eigenvector block in series with the second output, said second eigenvector block coupled to said first and said second antenna for applying a third weight factor to said second portion  $M_2$  of the  $M$  bits prior to transmission from said second antenna and for applying a fourth power weight factor to said second portion  $M_2$  of the  $M$  bits prior to transmission from said first antenna.

16.(Previously Presented) The device of claim 15 wherein said third and fourth power weight factors are based on at least one of a size of said first  $M_1$  and second  $M_2$  portion and a channel quality of a first and second channel provided by said channel feedback circuit, said first antenna transmitting over said first channel and said second antenna transmitting over said second channel.

17.(Previously Presented) The device of claim 11 wherein said encoder comprises an interleaver of length N, the transmitter further comprising a channel interleaver of length M having an input coupled to the output of the encoder.

18.(Previously Presented) The device of claim 11 wherein the first  $M_1$  and second  $M_2$  portion are the same size and the systematic bits are not equally distributed among the first  $M_1$  and second  $M_2$  portion.

19.(Previously Presented) The device of claim 11 wherein said demultiplexer operates to maximize a number of systematic bits in the first portion  $M_1$ .

20.(Previously Presented) The device of claim 11 further comprising a first subpacket selector having an input coupled to the first output of the demultiplexer, an input coupled to an output of the feedback circuit, and an output coupled to the first antenna, said first subpacket selector for selecting and combining, into a first transmission packet that is transmitted over the first channel, the first portion  $M_1$  and at least one additional subpacket from the first output of the demultiplexer, wherein a size of said first transmission packet is determined at least in part based on the output of channel feedback circuit.

21.(Currently Amended) A method comprising:  
encoding a plurality of input bits;  
based on a determined characteristic of at least a first channel, adaptively splitting the encoded input bits into a first subpacket defining a first subpacket size and a second subpacket defining a second subpacket size; and  
transmitting the first subpacket at a first rate and at a first power modified by a first weight value over the first channel and the second subpacket at a second rate that differs from the first rate and at the first power modified by a second weight value over a second channel.

22.(Currently Amended) An apparatus comprising:

an encoder to encode a plurality of input bits;

a demultiplexer, having an input coupled to an output of the encoder, to adaptively split the encoded plurality of bits into a first subpacket defining a first subpacket size and a second subpacket defining a second subpacket size;

a first antenna coupled to an output of the demultiplexer, to transmit the first subpacket at a first rate and at a first power modified by a first weight value over a first channel; and

a second antenna coupled to an output of the demultiplexer, to transmit the second subpacket at a second rate that differs from the first rate and at the first power modified by a second weight value over a second channel.

23.(Previously Presented) The apparatus of claim 22 further comprising:

a channel feedback circuit, having an output coupled to an input of the demultiplexer, to provide a channel characteristic of at least the first channel by which the demultiplexer adaptively splits the encoded plurality of bits.

24.(Previously Presented) The apparatus of claim 20 wherein the at least one additional subpacket comprises only parity bits.

25.(Previously Presented) The method of claim 1, further comprising:

channel interleaving the encoded packet of size M bits with other encoded packets; and wherein dividing the encoded packet is after the channel interleaving.

26.(Previously Presented) The device of claim 11, further comprising a channel interleaver disposed between the encoder and the demultiplexer and adapted to channel interleave the encoded packet of size M bits with other encoded packets.

27.(Previously Presented) The method of claim 21, further comprising channel interleaving the encoded input bits with other encoded packets prior to adaptively splitting the encoded input bits.

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28.(Previously Presented) The apparatus of claim 22 further comprising a channel interleaver disposed between the encoder and the demultiplexer and adapted to channel interleave the encoded plurality of input bits with other encoded packets.